SOUNDING OBJECTS: AN OVERVIEW TOWARDS SOUND METHODS AND TECHNIQUES TO EXPLORE SOUND WITHIN A DESIGN PROCESS.

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ABSTRACT

Sound is a neglected subject of today's products and services. The new technologies changed the way we interact with the people, objects and the world around us, thus, designers should aim at all senses, contemplating a multi sensorial experience. In this scenario sound becomes an important aspect to be considered during the project phase in a design process. Sound becomes part of the product identity and expression, the way the product talks to us. To foster this scenario designers should be aware of the possibilities and attributes of sound and how to explore them in a creative way. In this short paper we investigated published articles, workshops and publications to collect sound methods and techniques to be used into a design process. As a result, we proposed twenty essential sound methods that could be applied in a design thinking context. This is an ongoing research, part of a thesis experiment, since further methods and refinement could be added in the future.

KEYWORDS

Sonic Interaction Design, Sonification, Prototyping, Sound Methods, Auditory Display.

1. INTRODUCTION

We are living in the age of experiences. New technologies are changing the way we interact with others and with the world around us through products and services. The omnipresence of the internet, the connected objects (also know as internet of things, IOTs) and the huge adoption of smartphones created a whole new range of opportunities for designing products. At the same time with more technology, knowledge and capability in the hands of the designer, more complexity and variables take place in form of craft techniques, privacy and ethics. Current interactive products, services, and environments are appraised by their sensory attributes, in addition to their form and function [1]. Unfortunately, even with all this new range of possibilities, designers only focus on the visual aesthetics of products.

This is a consequence of the dichotomy of form and function stipulated by The Bauhaus school of thinking. However, products and services of today demand an holistic multissensorial approach. Designers should design for the senses. The products of everyday are part of our narrative, they are themselves part of a diegetic experience trough micro-narratives and micro-interactions with objects and the world around us. Hug [2] reinforces that computing technologies turn everyday artifacts into narrative, procedural objects. These objects consist in socio-cultural components in the narratives of our everyday lives, expressing our personality, status, emotions and attitudes. Thus, how to think in ways that can contemplate all the sensory aspect of a product. Since sound is the "voice" of things and relate to the manifestation of life, how to create expressive objects that fit in your day to day diegetic narrative?. Thus, this literally "disappearing" technology offers several opportunities for using sound in its design [2]. Opportunities to make sonically-enhanced products through design. The big issue is that designers are often unaware of the auditory domain, of its complexity and potential and largely ignore sound processing and synthesis methods. Sound can have a profound effect on the experience an emotional appraisals of everyday products in use [3]. How can designers embrace and understand sound in this age of narratives and experiences?

2. THE SOUND AESTHETICS

What is sound? In his book "Acoustic territories", the artist Brandon LaBelle investigated the role that sound can play in our culture, listening and contemporary society. Sound and auditory experience forms a primary sensual matter in continual contact with the body. The sonority of daily life is a deeply impressionable sensing, impinging on thought and feeling in ways that give accent to the shifting self. The physicality of sound, as a movement of air pressure, of vibration, of interpenetrating exchanges from all around, forms an enveloping and effective influence. Such experience fills everyday life with an ongoing material flux, forming a phenomenal life-force existing here and there in which we are deeply involved. [4]

There is a potential to convey numerous different messages by non-verbal sounds [5]. Although verbal portrayals and metaphors can be used (like "should sound like a kicking ball" or muffed, like "an old radio"), it is almost impossible to accurately describe nuanced modifications to sound, or to explain the full range of sounds one has access to through imagination [6]. However it's interesting to mention that sound and colors have a few sensory properties in common: sound is auditory and has properties such as tempo, pitch, timbre, and rhythm. Color is visual and has the

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properties of lightness, vividness, and hue. Although both sound and color map aspects of emotion, when used together there is a valuable way to convey meaning and information, forging sound and a visual stimulus that occurs at the same time into an "augmented perception". Chion [17] called it synchresis, an acronym formed by telescoping together the two words synchronism and synthesis. Thus, how can we make expressive artifacts, guided by narratives and metaphors. How can we make objects talk?

2.1 The Sonic Interaction Design

Sonic Interaction Design (SID) is a field that is positioned at the intersection of auditory display, ubiquitous computing, interaction design and interactive arts [7]. The author also reinforces that SID can be used to describe practice and inquiry into the various roles that sound may play in the interaction loop between users and products, services and environments. In this sense, SID follows the trends of the so-called third wave of human– computer interaction, where culture, emotion, and experience, rather than solely function and efficiency, are the scope of interaction between human and machines. Sonic Interaction Design algo study methods and techniques to think, explore and attach sounds into everyday objects. To the date, concepts and guidelines in relation to notification and warning sounds, such earcons, auditory icons and sonification strategies for representation of data through sound have already been widely discussed [8] [12].

Also the relationship between the body movement, gesture and their relations to sound [9]. Even software frameworks for prototyping sounds using parameters and controls made using MAX/MSP are proposed [7]. An exploration of basic sound design methods, which are inspired by methods of the Bauhaus, can be found in the publications of Franinovic and others [10]. This is a challenge, as the criteria for designing interactive sounds are different from the criteria that drive aesthetics (visual and material). As a consequence, designers tend to stick to seemingly "save" strategies, like simple signals or based on existing sound libraries [2].

2.2 The Sonic Methods And Techniques

2.2.1 Sounding objects should be "sounds of novel".

Sound has to have a character and identity of its own, rather than sonic references to familiar "natural" sounds. Interactive products should be conceived as completely new sounds, without too obvious references to a "heritage artifact".

2.2.2 Sounding objects should be expressive and emotional.

The relationship between sound and signified (iconic or indexical relationship) as found in auditory icons and earcons are insufficient. Meaning and information cannot be conveyed in a satisfactory way by simply mapping isolated parameters like pitch, volume, speed or timbre. To achieve expressive and emotional sounds, designer should overlap different sounds to create a sound polyphony.

2.2.3 Play with Sound Aesthetics (8-bit Sounds/ Cartoonification).

Try to emulate sound using onomatopoeias, distortion, echo, delays, reverb and add some effects to them.

2.2.4 Play with natural and rational sounds of everyday objects.

They can be useful as a starting point of a "soundstorming". Sound is closely related to physical, material processes and plays a core role in communicating "hidden" qualities of an object, like stability, solidity, etc. [2].

2.2.5 Transcode objects, images, movements and data into sound.

Transcode colors, shapes, objects, images, event buildings into sound using softwares that can convert specific parameters into the sound realm. Tanaka [9] did some experiments converting photographic images into sound.

2.2.6 Foley Techniques.

A classic technique from sound design applied in cinema. Try to reinforce the sound aspects of the elements using materials that are not necessarily the ones that you are trying to represent.

2.2.7 Digital frameworks using MAX/MSP and Pure Data (PD).

Digital tools that allow that physical sound models can be created and changed dynamically according to input from the user (via some kind of sensor or MIDI controller). Rocchesso and his colleagues [7] created a tool that allows the designer to experiment with sounds.

2.2.8 Sound Scenarios/Sound experience map.

Sound elements are injected into a recorded narrative of intended use cases. Try to create scenarios of use of the object considering every interaction with the object, people and the environment around you, using only sound. Also it's important to map the emotional reaction to them, something similar to the experience maps methods used in service design. Storytelling is a important catalyst for making sound design decisions [2].

2.2.9 Soundmarks.

Based on the work of Murray Schafer. Schafer states that sound that are strongly representative of a soundscape, like The Big Ben Bell resembles London or the foghorn and doves that resembles a port. Another example is the choro and samba that are tied with the Rio de Janeiro image. This concept of soundmarks can be applied to a town, a building, a country, or even to a season [11].

2.2.10 Collect Everyday Interactions.

A way of gathering interesting sounds around you in the day to day using a simple recorder or even your smartphone. They are important to create a "soundboard".

2.2.11 Soundboards/Sound collage.

Why not boost the traditional moodboard (a board full os images, quotes and scenarios that are intended to convey meaning) with sound? That could be sound from digital libraries, sound collected on the streets, sounds made using foley techniques and so on.

2.2.12 The "Sonic Incident".

Remember an incident in the last two days, where the sound was memorable, and concentrate on emotions felt (frustrating, surprising, fear, etc.) and sketch the situation alongside with the sound descriptions.

2.2.13 Sound personality/Sound persona.

How do you want the personality of your object would be? Evil? In a hurry? Happy? Cute? A child? An old man?

2.2.14 Acoustic Ecology.

Another principle based on the work of Murray Schafer. Acoustic ecology is the whole set of sounds that are heard during the experience with a product. It is important to design all sounds as an "ecology" as sounds have relationships that need to be managed appropriately in a holistic way to have a cohesive experience.

2.2.15 Vocal Sketching.

Vocal sketching involves the use of the voice, along with the body, to demonstrate the relationship between action and sonic feedback. Vocal sketching, in essence, is as simple and straightforward as it sounds: the designer uses his or her voice to produce the sound that would be generated in the sonic interaction. It can be used both for idea exploration and as a way to refine sound ideas.

2.2.16 Sonic Guessing Game.

Try to illustrate everyday situations or the scenarios using only sound. It serves very well as warming up for design sessions. [3]

2.2.17 Sonic Superpowers.

Imagine an object that could emit any type of sound that you could imagine of. For example, how to enrich the experience of using a microwave through sound? Imagine if that microwave could emit sounds of something being electrocuted, or maybe a looping drum machine that beats accordingly to the way the food spins?

2.2.18 Sound Walks.

Sound walks were originally proposed by Murray Schafer as an empirical methodology. When performing a sound walk, people are asked to navigate in a delimited area with open ears, remembering all the sounds heard. This exercise is an ear opener and a good starting point to enhance the understanding of the sound ecology around us.

2.2.19 Create an Audio Drama using sound libraries and Foley.

This is achieved by designing a short audio drama involving the collection of content, either from existing sound libraries or generated by the designers themselves. The analysis of the performance makes designers aware of how sounds affect gestures and how, conversely, gestures may affect the mental representations elicited by sound. [3]

2.2.20 Sonic Wizard of Oz.

It's a form of video prototyping in which an interaction is filmed and the sonic elements are added over the footage at a later stage, creating a video of a fake sonic interaction. Sonic overlaying gives the designer the best possible conditions for creating the desired sound. At the editing table, the variety of sonic materials available to the designer can be found or created, be they voice, everyday objects, music, downloaded sound samples, and the like.

3. CONCLUSION AND FUTURE STUDIES

For the future work we plan to collect more sound methods and proposed new ones based on classic methods of design. This would complement the methods and techniques already collected in that article. We also intend to cross some thoughts and ideas of Pierre Schaeffer [13], Murray Schefer [14] [15], Elif Özcan [16] and Michel Chion [17] to structure a sound taxonomy which will serve as framework to explore new methods to think and understand sound in a design context. Finally, it would be crucial to validate these sound design methods in a real design project environment to test it's effectiveness and problems encountered in a real problem solving setting. These will be the basis of my ongoing master thesis.

Despite numerous advantages and ways to shape experiences in products and services, the sonic aspects are extremely neglected in the design processes. In this article we tried to understand the possibilities of tools and methods for sound in design. In the first moment, one important part was to understand the double-diamond and human-centered design approaches and all the dynamics of divergence and convergence thinking during the design process. And most importantly, to know some of the most used design methods and tools in those environments. In the second moment, gathering and research about sound methods was extremely valuable. These methods are pulverized in different articles by different authors, most of these articles are about workshops where these sound methods were tested and prototyped. Thus, it was possible to have a broader and deeper understanding of sound methods in design. The exercise of researching, mapping, collecting and organizing some of the methods for thinking sound in design processes was proven to be extremely valuable. At last, it was possible to have a detailed understanding about the state of the art of these tools and how they can be evolved, or even suggest new tools and techniques. It is important to understand that sound has an extreme ability to enrich products and services and there is a lot of unexplored potential. With new technologies and new possibilities there is still much to be done. A set of solidified methods is needed to think and design the "talking objects" of tomorrow.

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